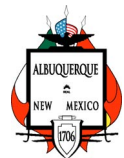

Comments on EPA's Proposed Arsenic Rule:

40 CFR Parts 141 and 142 National Primary Drinking Water Regulations; Arsenic and Clarifications to Compliance and New Source Contaminants Monitoring; Proposed Rule

Submitted by



The City of Albuquerque

September 20, 2000

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Abbreviations

AA	ACTIVATED ALUMINA
ACWA	ASSOCIATION OF CALIFORNIA WATER AGENCIES
AS	ARSENIC
AsRP	ARSENIC RESEARCH PARTNERSHIP
AWWARF	AMERICAN WATER WORKS ASSOCIATION RESEARCH FOUNDATION
BAT	BEST AVAILABLE TECHNOLOGIES
BCA	BENEFIT-COST ANALYSIS
BECC	BORDER ENVIRONMENT COOPERATIVE COMMISSION
BT	BENEFIT TRANSFER
BV	BED VOLUME
CCR	CONSUMER CONFIDENCE REPORT
CDC	CENTERS FOR DISEASE CONTROL
CFR	CODE OF FEDERAL REGULATIONS
C/MF	COAGULATION/MICROFILTRATION
CWS	COMMUNITY WATER SYSTEM
DOT	DEPARTMENT OF TRANSPORTATION
EA	ENVIRONMENTAL ASSESSMENT
EBCT	EMPTY BED CONTACT TIME
EDR	ELECTRODIALYSIS REVERSAL
EEAC	ENVIRONMENTAL ECONOMICS ADVISORY COMMITTEE
EPC	ENVIRONMENTAL PLANNING COMMISSION (CITY OF ALBUQUERQUE)
EPRI	ELECTRIC POWER RESEARCH INSTITUTE
EPA	U.S. ENVIRONMENTAL PROTECTION AGENCY
FDA	U.S. FOOD AND DRUG ADMINISTRATION
FeCl ₃	FERRIC CHLORIDE
FONSI	FINDING OF NO SIGNIFICANT IMPACT
GFAA	GRAPHITE FURNACE ATOMIC ADSORPTION
GFD	GALLONS PER SQUARE FOOT PER DAY
GFH	GRANULAR FERRIC HYDROXIDE
GHAA	GASEOUS HYDRIDE ATOMIC ADSORPTION
GPM	GALLONS PER MINUTE
GPPAP	GROUND-WATER PROTECTION POLICY AND ACTION PLAN (CITY OF ALBUQUERQUE)
HMVM	HUNDRED MILLION VEHICLE MILES
HRRCA	HEALTH RISK REDUCTION AND COST ANALYSIS
H ₂ SO ₄	SULFURIC ACID
ICP-AES	INDUCTIVELY COUPLED PLASMA ATOMIC EMISSION SPECTROSCOPY
ICP-MS	INDUCTIVELY COUPLED PLASMA MASS SPECTROSCOPY
IOC	INORGANIC CONTAMINANT
IX	ION EXCHANGE
KG	KILOGRAM
LQG	LARGE QUANTITY GENERATOR
LYS	LIFE YEARS SAVED

M	MOLAR
MCL	MAXIMUM CONTAMINANT LEVEL
MF	MICROFILTRATION
MGD	MILLION GALLONS PER DAY
µg/L	MICROGRAM PER LITER
MG/L	MILLIGRAM PER LITER
MNC	MICRONUCLEATED CELLS
MOE	MARGIN OF EXPOSURE
MSW	MULTI-STAGE WEIBULL MODEL
NaCl	SALT
NAFTA	NORTH AMERICAN FREE TRADE ACT
NaOH	CAUSTIC SODA
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
NRC	NATIONAL RESEARCH COUNCIL
O&M	OPERATIONS AND MAINTENANCE
OMB	OFFICE OF MANAGEMENT AND BUDGET
OR	ODDS RATIO
ORD	OFFICE OF RESEARCH AND DEVELOPMENT (EPA)
OGWDW	OFFICE OF GROUND WATER AND DRINKING WATER
PNR	PUBLIC NOTIFICATION RULE
POE	POINT OF ENTRY
POR	PREVALENCE ODDS RATIO
POTW	PUBLICLY OWNED TREATMENT WORKS
POU	POINT-OF-USE (SYSTEMS)
PQL	PRACTICAL QUANTITATION LEVEL
PSI	POUNDS PER SQUARE INCH
PSIG	POUNDS PER SQUARE INCH GAUGE
PV	PRESENT VALUE
RCRA	RESOURCE CONSERVATION AND RECOVERY ACT
RIA	REGULATORY IMPACT ANALYSIS
RO	REVERSE OSMOSIS
SAB	SCIENCE ADVISORY BOARD
SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
SDC	SERVICES DURING CONSTRUCTION
SDWA	SAFE DRINKING WATER ACT
SRF	STATE REVOLVING FUND
SVOC	SEMIVOLATILE ORGANIC COMPOUNDS
TC	TOXICITY CHARACTERISTIC
TCLP	TOXICITY CHARACTERISTIC LEACHING PROCEDURE
TDS	TOTAL DISSOLVED SOLIDS
TMP	TRANSMEMBRANE PRESSURE
TSDF	TREATMENT, STORAGE, AND DISPOSAL FACILITY
VOC	VOLATILE ORGANIC COMPOUND
VSL	VALUE OF STATISTICAL LIFE
VSLY	VALUE OF STATISTICAL LIFE YEARS
WET	WASTE EXTRACTION TEST (STATE OF CALIFORNIA)
YLL	YEARS OF LIFE LOST

Executive Summary and Recommendations

City of Albuquerque's Position on the Proposed Arsenic MCL

As detailed in this document prepared by the City of Albuquerque, New Mexico, we conclude that the U.S. Environmental Protection Agency (EPA) has not met its responsibility to propose a new National Primary Drinking Water Regulation (NPDWR) for arsenic based on sound science and proper cost benefit analysis as required by the Congress under the Safe Drinking Water Act. The City of Albuquerque supports an arsenic regulation that is based on the best available science and that carefully considers the relative costs and benefits, as required by law.

The City of Albuquerque (The City) has thoroughly reviewed the EPA's June 22, 2000 proposed NPDWR for arsenic, including the EPA's discussion of arsenic health risks, arsenic occurrence, arsenic treatment technologies, and the cost of implementing arsenic treatment, as well as numerous studies on arsenic conducted by the City. Based on our careful review, the City of Albuquerque believes that the proposal is procedurally and substantively flawed to the point where the City's ability to provide informed public comment and participate meaningfully in the regulatory process is seriously undermined. Therefore, the City of Albuquerque believes that the EPA should withdraw the proposal in order to address the fundamental deficiencies. As an alternative, upon the EPA's withdrawal of the proposal, the City of Albuquerque supports the development of a NPDWR for arsenic through a negotiated rulemaking.

EPA proposes a Maximum Contaminant Level Goal (MCLG) of 0 micrograms per liter (ug/L), and a Maximum Contaminant Level of 5 ug/L. The EPA also solicits comment on MCLs of 3, 10, and 20 ug/L. The City is concerned that the range of MCLGs and MCLs presented by EPA places the City in a compromising position. This is because none of the MCLG or MCL options specifically presented by the EPA for comment may be supportable under the statutory requirement to utilize the best science. By restricting the potential range of MCLs to 3, 5, 10, and 20 ug/L, the proposal forces stakeholders interested in sound science, such as the City, into a position where they are compromised into supporting an MCL of 20 ug/L, even though that level may not be scientifically appropriate or legally supportable. Because of the manner in which the proposal presents the range of potential MCLs, these comments discuss an MCL of 20 ug/L as though it is the most likely to be supportable on the rulemaking record as meeting the statutory requirements. Therefore, an MCL of not less than 20 ug/L is most favored by the City out of the range of options presented in the proposal.

As stated above, the City of Albuquerque believes that the proposal should be withdrawn to correct the fundamental deficiencies, and that the EPA should considered developing the regulation through a negotiated rulemaking. In the event that the EPA insists on moving forward with the present proposal, the City of Albuquerque supports the following:

1. The EPA should substantially revise the proposed arsenic rule and promulgate a MCLG and MCL for arsenic based on the best available, peer-reviewed science and accepted methodologies, taking feasibility and costs into consideration. The EPA should properly re-access the health risks of low levels of arsenic in drinking water by completing at least five epidemiological studies using data from U.S. populations. These studies should begin immediately. The EPA should also reexamine its cost predictions, which the City believes are grossly underestimated, and its determinations of what technologies are actually feasible.
2. The EPA should establish a non-partisan National Arsenic Commission consisting of health experts, water utility professionals, regulators, and impacted citizens with the specific charge of determining what health studies on U.S. populations and treatment studies are needed, how those studies will be completed, evaluation of the results of those studies, and how those studies will be used in evaluating future revisions of the arsenic MCL. The EPA should request and provide sufficient funding to effectively implement and complete health risk studies on U.S. populations in a reasonable period of time.
3. Within 6 years, the EPA and the National Arsenic Commission should review the arsenic health risk data available and together determine if lowering the arsenic MCL is warranted.
4. Due to the lack of arsenic treatment technologies for utilities that rely upon ground water, the EPA should provide a minimum of an 8-year compliance period, following promulgation of the arsenic rule, to allow for development and demonstration of emerging technologies.
5. The EPA should fund a research and development program to establish at least three Best Available Technologies (BATs) for arsenic treatment processes for utilities that rely upon ground water. This will include supporting installation and operation of full-scale demonstration plants for each identified BAT.
6. The EPA should take the full 12 months between the date the draft Preamble was published (June 22, 2000) and the promulgation date to allow for effective review of comments on this important regulation.

EPA Should Not Be Using Their Own Unsupported Policy Judgement To Set The MCLG And MCL

The City's comments reflect our understanding of the development of the proposed regulation including review of the relevant documents prepared by the EPA, attending stakeholder meetings in various locations and interactive participation through telephonic connection at the public meeting held in Reno, Nevada, on August 9, 2000.

As a water provider, the City's primary responsibility is to protect the public health and welfare of our citizens. It is a responsibility that the City takes very seriously and has endeavored to meet or exceed every regulation promulgated under the Safe Drinking Water Act. We, however, have serious concerns about the development of the proposed revision to the drinking water standard for arsenic.

Under the 1996 Amendments to the Safe Drinking Water Act, Congress mandated that the EPA analyze the cost benefit of new regulations that are to be based on the best available, peer-reviewed science and accepted methods. The City supports, as mandated by Congress, utilizing good science to develop and implement drinking water regulations to protect the public health and the environment. In this case, however, the EPA discounted the Millard County, Utah study, the single study using accepted methods and completed in the United States, and stated that it is “not representative of the U.S. populations” (EPA, 2000 Page 38899, Section III).

The Taiwan study, which relied upon by the EPA, was an ecological epidemiological study where the actual waterborne arsenic levels for each person were not known, but were estimated. This is not an accepted method. Based on the findings from the study completed in Millard County, Utah, one could argue that the results from a study of arsenic health effects in Taiwan cannot be extrapolated to the United States. More specifically, no evidence of increased cancer risk has been seen in studies of U.S. populations exposed to low levels of drinking water arsenic. The City supports the need to complete the necessary arsenic health effects studies immediately and to use the information in the regulatory review process in 6 years.

The EPA has further stated that “because current data on potential modes of action are supportive of sublinear extrapolations, the linear approach could overestimate risk at low doses” (EPA, 2000 Page 38903, Section IV). The EPA also notes that the overestimate “makes an increasing difference as dose decreases” (EPA, 2000 Page 38903, Section IV). Given the uncertainty in the model used to predict risks, the EPA concludes, “decisions about safe levels are public health policy judgements” (EPA, 2000 Page 38903, Section IV).

The EPA’s conclusion that decisions about safe levels are a public health policy judgement does not meet the mandate by Congress under the 1996 SDWA Amendments. The lowering of the arsenic standard, which will cost this nation billions of dollars annually, should not be a judgement arbitrarily made by the EPA. Any decision related to protecting public health, particularly of this magnitude, should be based on sound science and a rigorous cost-benefit economic analysis. The health studies should be completed on U.S. populations to ensure that other social and environmental factors are adequately taken into account. The precedent to allow the EPA to lower standards based on individual policy judgement is inappropriate and the proposed arsenic rule should be withdrawn. Congress mandated that the development of standards be based on sound science with detailed cost-benefit analyses. The City of Albuquerque supports that approach.

The City of Albuquerque supports the development of regulations that protect the public health and welfare of our citizens. We cannot, however, support the lowering of standards based on EPA’s public policy judgements.

Health Effects of Low Arsenic Levels Are Uncertain

The EPA has proposed a revision of the arsenic drinking water standard, recommending an MCL of 5 µg/L and requesting comments on other possible MCLs: 3 µg/L, 10 µg/L, and 20 µg/L. The EPA’s risk assessment suggests that the current MCL may need to be made more restrictive in order to offer a greater margin of safety. However, there is not sufficient

epidemiological evidence currently available to accurately quantify the health risks that may be associated with the low levels of arsenic found in the U.S. drinking waters. The limited data that is available suggests that there is little or no risk. Questionable methodologies in the risk assessment that the EPA has conducted raise concerns about EPA's estimated number of cancer cases which will be prevented by the proposed arsenic MCL. We believe the information used by the EPA has overestimated the health benefits for the U.S. population and is in direct conflict with the recommendations of the NRC (1999) report, and recent studies on U.S. populations.

Current scientific information does not allow EPA to establish a more stringent MCL without resolving many of the uncertainties associated with the estimate of health risks and benefits. If the MCL were revised from 50 µg/L to 20, 10, 5, or 3 µg/L, a greater theoretical margin of safety will be provided, and the magnitude of that theoretical margin of safety will increase as the MCL is made more restrictive. However, any expected health benefits are highly uncertain at any of the proposed MCLs.

Evidence from epidemiological studies recently reported in the United States and Europe suggests that the risk of bladder cancer, lung cancer, and cardiovascular disease is not increased at the current MCL of 50 µg/L, and we believe additional epidemiological studies should be conducted. These studies should be completed in the United States to obtain more information about cancer risks in U.S. populations that have been exposed to low to moderate levels of arsenic in drinking water (less than several hundred micrograms per liter) for 20 to 40 years. Incidence studies, in addition to mortality studies, should be considered where such information is available.

If the combined cancer risk of waterborne arsenic exposure in the United States is "on the order of 1 in 100" as estimated by the Subcommittee on Arsenic in Drinking Water, NRC (1999, page 8), epidemiological studies in the United States should be able to detect an increased cancer risk. The Subcommittee (NRC, 1999, page 3) also recommended additional epidemiological studies: "Additional epidemiological evaluations are needed to characterize the dose-response relationship for arsenic-associated cancer and noncancer endpoints, especially at low doses. Such studies are of critical importance for improving the scientific validity of risk assessment."

An MCL must be based on the best available, peer-reviewed science and accepted methods, and while the presently "best available" science indicates that the MCL does not need to be lowered, many questions remain. Additional research is clearly needed to reduce the uncertainties about health risks at the low drinking water exposures found in the United States before EPA can support lowering the MCL for arsenic. What is the likely exposure-response relationship at low arsenic exposures? Is arsenic a co-carcinogen or promoter? Are increased bladder and lung cancer risks seen primarily in smokers who are exposed to low levels of arsenic? These key questions must be answered to estimate health benefits with greater certainty, and both epidemiological and laboratory studies will be needed to provide answers. Although additional research was recommended by Congress and the NRC to clarify the possible associations at low levels seen in the United States and the possible mode of action, this research is yet to be completed.

EPA Has Not Met the Risk Assessment, Management, and Communication Requirements in Section 1412(b)(3) of the 1996 Safe Drinking Water Act (SDWA) Amendments

The EPA's explanation of the potential health effects posed by arsenic in drinking water and the potential benefits from the proposed regulation is unclear and disorganized, which makes informed public comment difficult, if not, impossible. This is clearly an indication that the EPA was forced to hurriedly publish the proposal, resulting in a rushed and haphazardly constructed proposed regulation. It also shows that EPA's application of its Safe Drinking Water Act authority under this proposal amounts to an unconstitutional delegation of legislative power.

EPA Has Not Followed the Legal Intentions of the SDWA

The EPA's proposal to regulate arsenic in drinking water fails to meet the basic minimum requirements of law. Albuquerque realizes that the EPA's proposal in large part may be driven by the pressures of litigation by the Natural Resources Defense Council (NRDC) and budgetary constraints. However, the Agency's interest in expedience cannot absolve it of its basic statutory mandates. While Albuquerque unequivocally supports sensible public health protections, Albuquerque cannot countenance a "rush to judgment" on a NPDWR for arsenic that does not abide by the applicable legal requirements.

The EPA's proposal clearly deviates from the legal requirements on several fundamental levels. Most disturbingly, the Agency has ignored the substantive Congressional directive to utilize the best available, peer-reviewed science and accepted methods, electing instead to embrace an inconclusive compilation of prior studies that admittedly relies on outdated and unreliable data and methodologies. At the outset, the process the Agency has employed to develop this regulation disregards the critical opportunities for public participation and thoughtful deliberation as mandated by Congress.

With respect to the relevant facts that must support the proposal, many of the EPA's factual assumptions and determinations bear little relationship to the practical realities of implementation. These inaccurate assumptions have so skewed the rule's cost-benefit analysis, and the decisions derived from it, as to render them arbitrary and capricious. The EPA can, and must, do better. The regulated public is entitled to strict adherence to the non-discretionary procedural and substantive mandates of the Safe Drinking Water Act.

Albuquerque is also concerned that in developing its proposal, the EPA has adopted a constitutionally infirm interpretation of its authority under the Safe Drinking Water Act. Specifically, the Agency asserts the authority to make broad public policy decisions, yet advances no intelligible principles to guide its decisionmaking. As such, the Agency's construction of the Safe Drinking Water Act in this rulemaking constitutes an impermissible delegation of legislative authority.

Albuquerque supports a revision to the NPDWR for arsenic that supports public health and meets the legal criteria, and believes that the proposal should be withdrawn and repropose in a manner, which satisfies the legal requirements. The legal structure of a NPDWR should

be built in a pyramidal fashion, with the best available, peer-reviewed science and accepted methods as the foundation that supports a meaningful (HRRCA), culminating in careful cost-benefit decisions and ultimately a MCLG and MCL at the top.

Rather than a pyramid, the EPA's proposal is built like a house of cards. The foundation of best available, peer-reviewed science and accepted methods is substantively inadequate to support the rest of the structure. The HRRCA essentially does not exist, and thus the regulated community has been deprived of an important procedural aspect of this rulemaking. The cost-benefit decisions are premised on arbitrary and faulty assumptions. The proposed MCLG and MCL are unsupportable under the statute and thus are arbitrary and capricious.

Additional Studies Are Needed

The arsenic MCL has been in interim status since the Safe Drinking Water Act was implemented over 25 years ago. The EPA has not, until recently, begun funding research to support the development of an arsenic MCL.

In June 1996 AWWARF, Association of California Water Agencies (ACWA), and the EPA created the Arsenic Research Partnership (AsRP) for the purpose of funding research to increase the understanding of the health effects of arsenic at low levels in drinking water. Prior to the establishment of the AsRP, AWWARF funded five projects worth, \$1.4 million, on arsenic treatment, detection, and health effects.

The research process is overseen by the AsRP members. AWWARF, ACWA, EPA Office of Research and Development (ORD), and EPA Office of Ground Water and Drinking Water (OGWDW) each appointed two members to the AsRP. The EPA, AWWARF and ACWA released a joint solicitation for research applications with the EPA for approximately \$3 million in March 1997. Under the joint agreement with the EPA and ACWA, AWWARF manages approximately \$1 million worth of research and the EPA manages approximately \$2 million worth of research.

This research has just begun to scratched the surface of understanding arsenic epidemiology and the treatment technologies to remove arsenic. We have a long way to go before we truly understand how arsenic cause cancer, let alone what level of arsenic is appropriate to protect human health. The EPA has been visibly lacking in the support and implementation of epidemiological studies of U.S. populations with low levels of arsenic drinking in their drinking water. As such, it is questionable whether there is even an arsenic problem in the United States.

Further, the NAS report made several specific recommendations about research projects that must be initiated now so that the best available, peer-reviewed science is available to EPA when the arsenic regulation is revised in six years, per Section 1412(b)(9) of the 1996 SDWA Amendments. EPA should include these critical arsenic research needs as the Agency develops a comprehensive drinking water research plan. EPA's efforts, to date, on a comprehensive research plan have focused solely on the Contaminant Candidate List (CCL) and have not cited the need for any research to support the six-year review of any of the drinking water regulations, including arsenic.

Presented below are several studies that we recommend:

A. We propose that studies be funded in three U.S. communities to examine cardiovascular risk in persons exposed to elevated levels of waterborne arsenic. One of the studies should be conducted in Fallon, Nevada. These studies should include:

1. An examination survey to determine if residents have evidence of premature cardiovascular lesions, high blood pressure, and increased serum lipid profiles
2. A similar study in a control population with low levels of waterborne arsenic exposure
3. A review of mortality and health care records for both the exposed and the control population over a 20 year period.
4. An examination of cardiovascular outcomes for children

We estimate the cost of these studies will be around \$500,000 for each study.

B. We propose that health examination surveys be conducted in two cities to determine if there is an elevated prevalence of arsenical hyperkeratosis in U.S. cities with elevated levels of waterborne arsenic. These studies should also include control communities to determine the background prevalence of these lesions. We estimate the cost of these studies will be around \$500,000 each.

C. We propose three cancer case control studies be conducted in states with elevated waterborne arsenic exposures. These should follow protocols similar to the National Bladder Cancer Study from the 1970's. We estimate the cost of these studies will be \$2,000,000 for each study.

D. We suggest that the Utah cohort be followed further by the US EPA scientists who conducted the prior study. This should include deaths since 1996. Included among the analyses should be a comparison of observed cancer and cardiovascular risks and predicted risks from the Taiwan studies. We estimate the cost of this study to be around \$500,000.

E. We propose that EPA further fund their research in North Carolina on mode of action studies (\$200,000 per year for each of 3 years) and biomarker studies (\$200,000 per year for each of 4 years). It is critical that this research be conducted by the North Carolina Chapel Hill group since this is the only EPA research team with a credible history of arsenic research.

F. We propose that two studies on reproductive health effects from waterborne arsenic should be funded. These must also include studies of control populations and examine a wide range of perinatal health outcomes. We estimate the cost of these studies to be \$1,000,000 each.

G. We proposed that three international studies on arsenic health effect be conducted in Europe, Canada, Australia, New Zealand or other countries with similar diets and other risk factors as U.S. populations. These studies may include cancer, cardiovascular, perinatal or other outcomes. We estimate the cost of these studies to be around \$500,000 each.

H. We recommend that one comprehensive exposure assessment study should be conducted to determine the total arsenic exposure and the component due to drinking water for U.S. populations. We estimate the cost of this study to be around \$1,000,000.

I. We suggest that further studies be conducted on possible beneficial health effects of arsenic at low doses. EPA has proposed reducing human exposure to zero if possible. However, there is evidence that arsenic may have beneficial, if not even essential effects at low doses. We estimate the cost of this study will be around \$500,000.

We suggest that a peer review process be established to review the arsenic research progress. This should occur outside of EPA since EPA has had a poor record of conducting U.S. research on the health effects of waterborne arsenic, with the exception of the Utah mortality study. This peer review group should report to Congress each year on progress and problems with the research programs of EPA, AWWARF and others. We believe that funding for these research programs should not go into general investigator initiated pools but should be conducted through a variety of arrangements, including the American Water Works Association Research Foundation, internal EPA conducted research, EPA cooperative research projects and specific requests for proposals to conduct these studies. Internal EPA conducted research initiatives must be linked to additional full time employees to allow the research to be conducted. It is critical that funding not be further diverted to additional international studies that do not provide adequate information about the risks for U.S. populations. It is also critical that no additional ecological studies, such as those conducted in Taiwan, Chile and Argentina, be conducted. We need accurate exposure assessment for each individual in the study populations.

Unintended Consequences of Arsenic Treatment

The implementation of the proposed arsenic rule will have unintended consequences that have not been considered by the EPA. Because of the high level of uncertainty associated with the health risks, the implementation of treatment may result in more years of life lost than would be saved assuming there is a health risk associated with low levels of arsenic in drinking water. We repeat, the implementation of the proposed arsenic rule may do more damage than good in terms of years of life lost. As such, it is imperative that the health risks of low levels of arsenic in drinking water be accurately known before the arsenic MCL is made more stringent.

The City of Albuquerque has estimated the number of traffic accidents, injuries, and deaths associated with vehicle travel to operate the ion exchange, activated alumina, and coagulation/microfiltration technologies in Albuquerque.

The analysis performed in Section 7, entitled Unintended Consequences, indicates that considering a Multi-stage Weibull exposure response model, the number of years of life lost due to traffic accidents at an MCL of 5 ug/L with ion exchange are estimated to be 113 years of life lost. While the years of life lost to arsenic related bladder cancer are 35 years of life lost. The EPA must consider these types of unintended consequences with the arsenic rule.

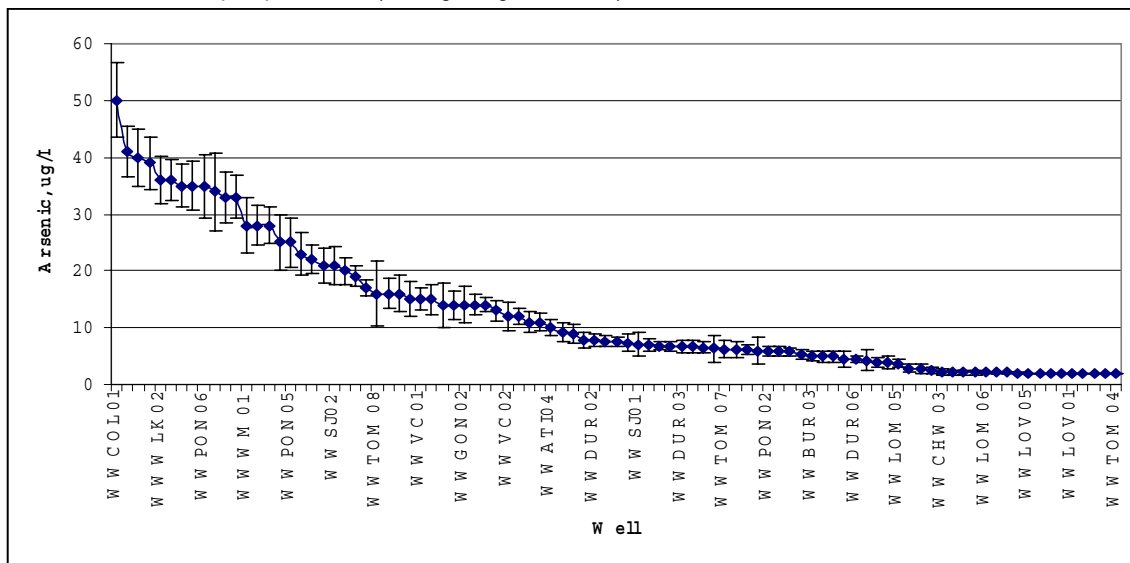
Albuquerque Has a Long History of Studying Arsenic

The City of Albuquerque has studied the issues related to arsenic treatment more than any other water utility in the United States. We have funded world-class research related to arsenic treatment technologies that have resulted in the best available understanding of the ion exchange, activated alumina, and coagulation/microfiltration technologies. We have provided this information to the EPA on numerous occasions. Because of our understanding of the arsenic issues, the comments provided in this document are especially authoritative and relevant, as such, it is necessary for the EPA to fully acknowledge and incorporate these comments.

Arsenic Occurrence

The City of Albuquerque has a groundwater supply system of 92 large production wells. The arsenic levels for these wells are shown in Figure ES-1.

FIGURE ES-1
Arsenic Levels in Albuquerque's Wells (Average, High, and Low)



The number of Albuquerque's wells impacted at various arsenic MCLs are shown in Table ES-1.

TABLE ES-1

Number of Albuquerque Wells Impacted at Various Levels

MCL (µg/L)	Number of Wells Exceeding Level Based on Average Arsenic Concentration
20	23
10	40
5	65
3	73

The proposed arsenic rule will have a significant impact on the water supply of the City of Albuquerque. At an arsenic MCL of 5 µg/L, the EPA (2000, 65 *Fed. Reg.* 38908, Table V-3) estimates that 5,302 community water systems utilizing ground water will be out of compliance. The overwhelming majority (67 percent) of these systems are in the size category of 25 to 500 people. The proposed arsenic rule will significantly impact many small communities in the United States that do not have the technical or financial capability to implement treatment.

In New Mexico, around 25 percent of the community water systems in the state would be impacted at an arsenic MCL of 5 µg/L. Presented in Table ES-2 is an estimate of impacted community water systems in New Mexico at various arsenic MCLs.

TABLE ES-2

Estimated Community Water Systems Impacted in New Mexico at Various Arsenic MCLs

Arsenic MCL (µg/L)	Community Water Systems in New Mexico Impacted
3	600
5	370
10	115
20	37

Therefore, at 5 µg/L, the state of New Mexico represents around 7 percent of the total community water systems in the nation that would be impacted. As such, the state of New Mexico may be the most impacted state in the nation by the proposed arsenic rule. This is especially difficult when considering the fact that New Mexico is also one of the poorest states in the nation and least capable of complying with an arsenic regulation that has no measurable health benefits.

BAT Arsenic Treatment Technologies Are Inappropriate

Of the six technologies that EPA has cited as BATs, none are feasible in Albuquerque. In addition, we contend that none of these technologies will have significant application to the majority of ground-water systems in the United States. As such, the EPA is proposing to promulgate a lower arsenic MCL, yet the technologies that they have proposed are not applicable to the majority of water systems. The ion exchange and activated alumina technologies may generate a hazardous waste rendering these technologies incompatible with source water protection requirements. The modified coagulation/microfiltration and modified lime softening technologies are only appropriate for surface waters, of which there are very few impacted by arsenic. The reverse osmosis and electrodialysis reversal technologies waste too much water and the reject stream may have arsenic concentrations at levels too high to dispose of in a sanitary sewer.

It is unrealistic for the EPA to promulgate such a far-reaching regulation that will impact so many water systems without the field-tested experience to determine what technologies will work. There are only a handful of arsenic treatment facilities in the United States and these are very small and are typically designed for an arsenic MCL of 50 µg/L. We cannot evaluate the proposed treatment technologies based on the systems in operation today.

Because we have no large-scale experience with these technologies, it is quite likely that many water systems will implement technologies that are inappropriate. This may require eventual replacement and the expenditure of additional funds. It is clear that without proper experience with the various arsenic technologies, there will be many failures and many misapplications. Since the removal of arsenic has not been practiced to any degree in the past, it will be unreasonable to expect the impacted water utilities to research and select a technology with confidence within the proposed compliance period.

Because of the uncertainties associated with long-term operation of arsenic treatment technologies, including chemical storage and handling, residuals handling, the classification of the processes as large quantity hazardous waste generators, and the potentially hazardous nature of the residuals, it is clear that the true costs of implementing this regulation will be substantially more expensive than what the EPA has estimated.

There are several emerging technologies that hold promise for arsenic treatment; however, most of these technologies have not been implemented or even pilot tested in the United States. As such, we do not know enough about how these various emerging technologies will be impacted by the specific water quality of each water supply. It will take 3 to 5 years to fully test and evaluate the current emerging technologies so that the impacted water utilities can make informed decisions.

Many issues also will need to be resolved related to the practical side of construction of these facilities that the EPA has not considered. These include the acquisition of land for treatment facilities potentially resulting in the need to condemn adjacent properties. In many communities, approval of construction by environmental commissions will be required and the requests may possibly be denied. If denial occurs, the loss of a valuable water resource will occur.

The water wasted as a result of treatment to remove arsenic is a critical issue for water systems in the desert Southwest. This is especially cogent in light of the drought conditions we are experiencing this year. We do not have water resources to waste.

There will be a severe lack of trained and certified operators to operate and maintain these proposed arsenic treatment facilities. The cost of acquiring new operators and training existing operations staff has not been addressed by the EPA.

Cost of Arsenic Treatment Does Not Justify the Benefits

The costs of implementing arsenic treatment will be staggering, to Albuquerque, to New Mexico, to water systems in the arid Southwest, and to many water systems in the United States. The EPA has grossly underestimated the true cost of compliance of the proposed arsenic rule. At an arsenic MCL of 5 µg/L, the EPA estimates an annual national cost of compliance to be \$389 million per year. The American Water Works Association Research Foundation (AWWARF) study (AWWARF, 2000) estimated the national cost of compliance for an arsenic MCL of 5 µg/L will be \$1,460 million per year, around 3.75 times higher than the EPA's estimated costs.

In the City of Albuquerque, the cost of compliance with an arsenic MCL of 5 µg/L will be around \$38 million per year, or 10 percent of the total cost estimated by the EPA. This large percentage of the national cost is clearly not possible and shows the significant underestimation of the EPA's cost of compliance numbers.

The state of New Mexico will incur an estimated cost of over \$140 million per year to comply with an arsenic MCL of 5 µg/L. This is 36 percent of the total national costs that the EPA has developed. Again, it is not possible that the state of New Mexico represents 36 percent of the total cost of the arsenic rule; the EPA has clearly underestimated the cost of compliance.

It is clear that the EPA has underestimated the cost of compliance. It is also clear that the EPA has overestimated health risks associated with low levels of arsenic in drinking water by assuming a linear dose response curve. Because of these two major errors, the cost-to-benefit ratios presented by the EPA are not correct.

By comparison, in Albuquerque, we calculate that the incremental cost per life saved at an MCL of 5 µg/L, using the Multi-Stage Weibull model is \$4.7 billion. This is a factor of 770 times greater than value of a statistical life defined by the EPA in 1999 dollars of \$6.1 million. We also calculated that using the Poisson Model to estimate health risks, the incremental cost per life saved at an arsenic MCL of 5 µg/L is \$211 million. This is 35 times higher than the value of a statistical life defined by the EPA. The cost of arsenic treatment in Albuquerque is higher than the benefits from bladder cancer avoided at all MCLs being considered by the EPA. These issues are thoroughly examined in Section 3.

This issue is further amplified using EPA's own analysis, for example, based on bladder cancer, the benefits are never greater than the costs (EPA, 2000 Page 38950, Table XI-1), regardless of the MCL examined. For instance, at the lowest MCL being considered by the EPA, 3 µg/L, the EPA national cost estimate is \$643.1 million per year to \$753 million per year, yet the benefits related to bladder cancer avoided is only \$43.6 million per year to

\$104.2 million per year. Even with the costs grossly underestimated and the health risks greatly overestimated, the EPA's benefits do not equal the costs.

It is only by using "What If" scenarios that the EPA's analyses result in a cost-benefit ratio less than 1. Clearly, the use of "What If" scenarios in an economic analysis of costs and benefits to set a national drinking water rule would not be accepted by any economist, engineer, epidemiologist, regulator, water utility, or any educated person in the United States. They are not accepted methodology. This is evidence that the EPA's analysis is arbitrary and capricious in its development and use of cost-benefit analyses and further, is in direct violation of the intent of the Safe Drinking Water Act and the Administrative Procedures Act.

In the benefits analysis, the EPA has assumed that the risk management proposal (i.e., the proposed lower arsenic standard) will save lives immediately. In reality, the proposed lower standard would provide increases in life expectancies, beginning many years in the future, due to cancer latency. This future benefit needs to be discounted back to present value as recommended by the Environmental Economics Advisory Committee (EEAC) of the Science Advisory Board (SAB).

EPA Needs 12 Months to Evaluate Comments

Based on the information presented in these comments, the appropriate action on the part of the Agency would be to retract their existing proposal and start afresh in a transparent stakeholder-based process to develop the drinking water standard for arsenic. This may be most effectively done through a negotiated rulemaking.

If EPA moves forward with the current proposal, it must take the time to make fundamental revisions. The public comments on the proposed arsenic rule will be significant and comprehensive. The EPA needs to take at least 12 months to critically evaluate the information received during this public comment period and carefully consider changes in the final regulation prior to its promulgation. We believe that allowing litigation and a statutory deadline to drive imprudent public policy decisions would be disastrous. If this occurs, the public will suffer from an untenable and unsupportable regulation, and possibly more litigation.

Purpose of This Document

This document was developed by the City of Albuquerque in accordance with the Federal Register notice on June 22, 2000. The EPA has proposed an arsenic MCL of 5 µg/L and has requested comments on alternative MCLs of 3 µg/L, 10 µg/L, and 20 µg/L. This document provides a detailed evaluation of the health risks of low levels of arsenic in drinking water and the impacts of implementing treatment to remove arsenic. The City of Albuquerque will be the single most impacted public water system in the United States and has thoroughly studied all aspects of this proposed arsenic rule. This document is the culmination of those studies.

The City of Albuquerque has expended considerable efforts to prepare this document. EPA has a duty to address and take into consideration the very important data presented here. It

appears that the EPA has been arbitrary and capricious in developing the proposed arsenic rule, and this document is intended to provide the EPA with sufficient information to conclude the following:

1. There remains much uncertainty about the health risks of low levels of arsenic (below 50 µg/L) in drinking water, although the present best available science suggests that the risk is little or none. It also appears that the EPA has ignored specific recommendations of the National Research Council (NRC) Subcommittee on Arsenic in Drinking Water.
2. The treatment technologies that the EPA has proposed as BAT are not feasible for most community water systems in the United States.
3. The national cost of compliance developed by the EPA is grossly underestimated and does not reflect the true cost.
4. The EPA has not performed an appropriate cost benefit analysis as required by Congress under the Safe Drinking Water Act Amendments of 1996.
5. The EPA has not followed legal or procedural requirements in developing the proposed arsenic rule as required by Congress.

As requested by the EPA, the City has provided specific comments on the proposed arsenic rule in Section 9.